careers in
COMPUTERS

AN EARLY CAREER BOOK

An Early Career Book

careers in
COMPUTERS

Jo Anne Ray

photographs by
Milton J. Blumenfeld

This page
blank
to preserve
page order

Would you like to work with computers?

The computer is a machine that people use to find answers to many problems. When a computer is given certain information, it can solve a problem faster than people can.

The computer can find the answers to many problems, but it cannot think. People must do the thinking. They put the information into the computer. They also tell the computer what to do.

It takes many, many people to make and operate computers. These people must work very carefully because if they make a mistake in their jobs, the computer's answers will be wrong.

DESIGN ENGINEER

Computers look plain on the outside. But inside they are very complex. Many small parts in the computer work together to solve problems. Each part is designed, or planned, by a design engineer. For example, one engineer may plan the part of the computer that receives questions. That engineer draws a plan that shows where every wire and bolt should go. Then he or she builds a test model of the part. If the test model works, the computer company will begin making the part.

Because computers solve problems by means of mathematics, the engineers who design them must know a great deal about mathematics themselves.

PRODUCTION ENGINEER

The production engineer studies the design engineer's plan and test model. Then he or she figures out a way to assemble, or put together, the computer part. In this picture, a production engineer is talking to a mechanical engineer, an engineer who knows all about machines and how they work. Together, the engineers write out step-by-step instructions for putting the computer part together. If the workers have trouble putting the part together, the production engineer finds out what is wrong.

Do you like to work with puzzles? Each part of a computer is like a puzzle to the production engineer. He must find the quickest and best way of putting it together.

PRODUCTION SUPERVISOR

The production supervisor explains the written instructions for assembling a computer part to the workers who put the part together. He or she also checks to see that the part is being assembled correctly as the work on it progresses. The production supervisor makes sure that the workers follow a time schedule as they work. Each worker is responsible for a certain amount of completed work each day.

The production supervisor must know how to help people do a good job. He or she must give instructions very carefully.

ASSEMBLER

Assemblers put computer parts together. Many computer parts are very tiny. The wire that the assembler in this picture is handling is so small that she must use a microscope to work with it. Assemblers must have good eyes and be able to handle tiny objects.

Computer assemblers are very careful workers. The computer will not work unless all its parts are put together in the right way.

## ELECTRICAL TECHNICIAN

Electrical technicians test all the electrical parts of a computer to make sure they work. If some things do not work, they must find out what they are and fix them. Electrical technicians study blueprints—drawings that show all the electrical connections in a computer part. Then they compare the blueprints with the parts to see if the connections are properly assembled.
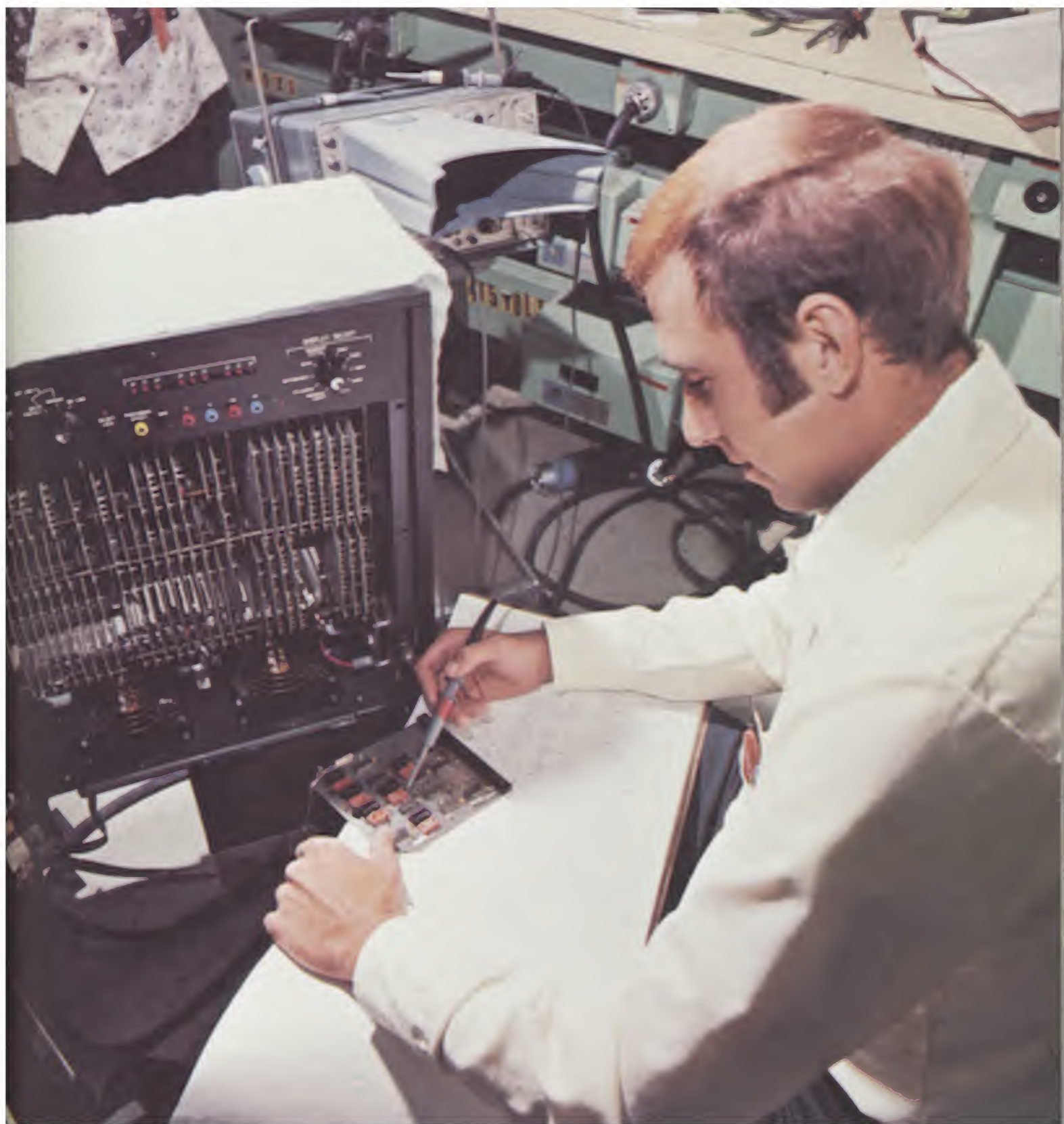
QUALITY ASSURANCE TECHNICIAN

Everything that makes up a computer is tested before the computer is put together. Quality assurance technicians test the materials from which the computer is made—metals and plastics.

Quality assurance technicians know what function each material serves. They test the metals and plastics with special instruments to make sure they function properly. If something is wrong with the materials, the quality assurance technicians report it so that different materials can be used.

QUALITY ASSURANCE ENGINEER

The quality assurance engineer is the last person to check the computer parts before they are put together. He or she makes sure that each part will work inside the computer.

The quality assurance engineer uses special instruments to test parts. He or she can tell when a particular part interferes with the function of the whole machine.

PACKAGING ENGINEER

Before computers can be sent to customers, they must be packed very carefully. Packaging engineers design the packages that hold the computers. They design a different package for every kind of computer. Packaging engineers must know several things about the computers before designing packages for them. They have to find out if the computers will be sent by truck, train, airplane, or boat. They must also measure the computers to find out what size packages will be needed. The packages have to be just the right size so the delicate computers will not be shaken or bumped.

TECHNICAL ILLUSTRATOR
AND TECHNICAL WRITER

An instruction book is packed with every computer when it is sent to the customer. The book uses pictures and words to tell the customer how the computer works. The technical illustrator draws the pictures for this book. He or she knows how to draw pictures of computer parts.

The technical writer uses words to explain what the customer must do to make the computer work. He or she must write carefully so the customer will understand the instructions.

CUSTOMER ENGINEER

Sometimes, after a computer is delivered, the customer has problems with the machine that he or she cannot solve. Then the company that made the computer sends a customer engineer to find out what is wrong. The customer engineer uses special tools and tests to find out why the computer isn't working right. When the problem is discovered, the customer engineer fixes the computer.

The customer engineer is a good mechanic. He or she knows how the computer parts work and what might go wrong with them.

SYSTEMS ANALYST

The systems analysts study the ways computers can help companies do their jobs. They find out if companies can get jobs done better and faster with the help of computers. Systems analysts talk to workers in companies to find out how they do their jobs. Then the systems analysts write reports for company managers that explain how computers can help the workers.

Systems analysts improve the operations of many companies. They can give advice about the appropriate kinds of computers to buy.

PROGRAMMER

Computers cannot solve problems or do jobs by themselves. Computer programmers give computers the information they need to work with. Programmers write sets of instructions for each job the computer must do. The instructions are called programs. After the programs are written, they are tested on the computer to make sure they are correct. Programmers know the information computers need and also how to put this information into a code, or special language, that the computer can use.

Programmers work very carefully. If they make even one mistake, the computer cannot give the correct answers.

KEYPUNCH OPERATOR

Keypunch operators put information into the code the computer can use to solve problems. Keypunch operators use machines that have keys like typewriters. But instead of typing words on sheets of paper, these machines punch holes in small cards. The punches on the cards are the code the computer uses. The punched cards give the computer the information it needs to do a job.

Keypunch operators are like good typists. They tap the keys quickly and accurately.

COMPUTER OPERATOR

Computer operators give computers the problems they must solve. There are several ways to get information from a computer. Sometimes the punched cards are used. Sometimes problems are put into computers on reels of tape. The operator in this picture is putting a taped problem into the computer.

CONTROL DATA | 170

INSTRUCTOR

Companies that make computers have special classes where people go to learn how to operate them. Special instructors teach these classes. In the classes, instructors often use diagrams, or pictures, of computers that show students the many different computer parts. Instructors also explain how information is put into a code that computers can use. When the students complete a computer course, they know how to be computer operators and programmers.

Instructors like to help people learn. Someday an instructor may help you learn about computers so that you can work in this interesting field.

Computer careers
described in this book

Design Engineer

Production Engineer

Production Supervisor

Assembler

Electrical Technician

Quality Assurance Technician

Quality Assurance Engineer

Packaging Engineer

Technical Illustrator and Technical Writer

Customer Engineer

Systems Analyst

Programmer

Keypunch Operator

Computer Operator

Instructor

A letter from a computer industry executive

CONTROL DATA
CORPORATION

8100 34TH AVENUE SOUTH
MINNEAPOLIS, MINNESOTA

Dear Readers,

Now that you have read this book, we hope
that you know more about how computers are
made and what they do. We also hope that
you have learned about the many kinds of
jobs in the computer industry.

Soon you may be using a terminal connected
to a computer in your classroom. Many schools
are already using computers to help students
with their schoolwork.

It takes many people to make sure that com-
puters work correctly. When you are old
enough to begin working, maybe you will want
to be one of these people.

Sincerely,

K. R. Nichols

K. R. Nichols
Control Data Corporation

AT a very early age, most children begin to think about what they will do when they grow up. Some boys and girls imagine themselves as doctors or teachers or auto mechanics; others picture themselves as airline pilots or truck drivers or computer operators. In today's changing world of work, any of these dreams can come true. The Early Career Books introduce young readers to the various occupations available to them, pointing out the many different skills and educational experiences needed for each career. The books emphasize the feeling of personal satisfaction and self-worth that comes from a job well done. Accompanying the easy-to-read text are full-page color photographs showing actual work situations.

"Easily read and understood titles . . . attractive in format. . . . handy for libraries which lack easy career-related materials."
—School Library Journal

"Colorful, attractive . . . has a place in the elementary classroom or school library."
—CAS Journal

"A pleasant, positive addition to an elementary classroom's or resource center's career library. . . . An obvious attempt has been made to avoid sex and racial stereotyping throughout." —Scholastic Teacher

"A serious approach to careers."
—The Instructor

Careers in AGRICULTURE
Careers in the AIR FORCE
Careers with an AIRLINE
Careers in ANIMAL CARE
Careers in the ARMY
Careers in AUTO MANUFACTURING
Careers in AUTO SALES & SERVICE
Careers in a BANK
Careers in BASEBALL
Careers in BEAUTY AND GROOMING
Careers with the CIRCUS
Careers with the CITY
Careers in COMPUTERS
Careers in CONSERVATION
Careers in CONSTRUCTION
Careers in a DEPARTMENT STORE
Careers in EDUCATION
Careers with a FIRE DEPARTMENT
Careers in FOOTBALL
Careers in HOCKEY

Careers in HOTELS & MOTELS
Careers in a LIBRARY
Careers in a MEDICAL CENTER
Careers in the NAVY
Careers with a NEWSPAPER
Careers in PHOTOGRAPHY
Careers with a POLICE DEPARTMENT
Careers with the POSTAL SERVICE
Careers in PRINTING
Careers with a RAILROAD
Careers in a RESTAURANT
Careers in SHIPPING
Careers in SOCCER
Careers in a SUPERMARKET
Careers with a TELEPHONE COMPANY
Careers with a TELEVISION STATION
Careers in the THEATER
Careers in TOY MAKING
Careers in TRUCKING
Careers at a ZOO

The Early Career Books are part of a complete career education program, which also includes Study Prints and filmstrips and cassettes with accompanying teaching guides.

MUSCLE BOUND

0307-7